HALEY & ALDRICH

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BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

WELL CLOSURE REPORT

GROUNDWATER MONITORING WELLS TMW-3, TMW-5, TMW-12, TMW-13, AND WCC-11S

To: **Mr. Brian Mossman**
Boeing Realty Corporation
3855 Lakewood Blvd.
Building 1A MC D001-0097
Long Beach, CA 90846

From: **Haley & Aldrich, Inc.**

Date: **April 18, 2003**

Re: **Well Closure Report, Groundwater Monitoring Wells TMW-3, TMW-5, TMW-12, TMW-13, and WCC-11S, Boeing Realty Corporation, Former C-6 Facility, Los Angeles, California**

Haley & Aldrich, Inc. is herein providing this groundwater monitoring well closure report to summarize the closure and final laboratory results from groundwater monitoring wells TMW-3, TMW-5, TMW-12, TMW-13, and WCC-11S at Boeing Realty Corporation's (BRC's) Former C-6 Facility in Los Angeles, California (Site). Groundwater monitoring wells TMW-3, TMW-5, TMW-12, TMW-13 were located in Parcel C and groundwater monitoring well WCC-11S was located along the northern boundary of Parcel A of the Site. The wells were closed due to location conflicts with new building construction. This work was conducted in accordance to the work plan entitled *Request for Well Closure, Groundwater Monitoring Wells TMW-3, TMW-5, TMW-12, TMW-13, and WCC-11S* dated October 11, 2002. The work plan was approved by the Los Angeles Regional Water Quality Control Board (LARWQCB) on October 24, 2002.

INTRODUCTION

Groundwater monitoring wells TMW-3, TMW-5, TMW-12, and TMW-13 were installed between July 1998 and February 1999 by Kennedy Jenks Consultants. Groundwater monitoring well WCC-11S was installed in September 1990 by Woodward-Clyde Consultants. Each of these wells was installed as part of a Site-wide groundwater monitoring program. The purpose of these groundwater monitoring wells was to facilitate sampling and measurement of groundwater conditions in the Bellflower Aquitard. The boring and well construction logs are included as Appendix A. Table 1 summarizes selected well construction information.

Table 1
Groundwater Monitoring Well Construction Information

Well No.	Boring Total Depth (feet)	Screen Depth Interval (feet)	Casing Diameter (inches)	Casing Type	Date Installed
TMW-3	87	62.5-82.5	2	Schedule 40 PVC	7/21/1998
TMW-5	89	64-84	2	Schedule 40 PVC	7/2/1998
TMW-12	89	63-83	2	Schedule 40 PVC	1/27/1999
TMW-13	85	60-80	2	Schedule 40 PVC	2/2/1999
WCC-11S	91	60-90	4	Schedule 40 PVC	9/13/1990

The LARWQCB is the lead agency for environmental activities at the Site and the County of Los Angeles, Department of Health Services (DHS) is responsible for the permitting of groundwater monitoring wells at the Site. Haley & Aldrich, Inc. submitted a monitoring well destruction service request application on November 21, 2002, notifying the DHS of the closure of groundwater monitoring wells TMW-3, TMW-5, TMW-12, TMW-13, and WCC-11S. A copy of the permit application is included as Appendix B. Monitoring wells TMW-3, TMW-12, TMW-13, and WCC-11S were destroyed in November 2002. Monitoring well TMW-5 was not destroyed in November 2002 due to elevated groundwater sampling results observed during the September 2002 monitoring event. Monitoring well TWM-5 was subsequently resampled in March 2003 as part of the site-wide annual groundwater monitoring event and destroyed on April 4, 2003.

FIELD ACTIVITIES

The scope of work for the closure of monitoring wells TMW-3, TMW-5, TMW-12, TMW-13, and WCC-11S consisted of monitoring and sampling groundwater, submitting the groundwater samples to the laboratory for analysis, and to proper destruction of the wells. These tasks are discussed below.

Groundwater Monitoring and Sampling

TAIT Environmental Management, Inc., BRC's groundwater monitoring and sampling subcontractor, gauged and sampled monitoring well TMW-3 on September 19, 2002, TMW-5 on March 24, 2003, TMW-12 on September 18, 2002, and TMW-13 and WCC-11S on March 22, 2002. The water levels were gauged against the top of the well casing to the nearest 0.01-foot using an electronic water level indicator (Table 2).

Table 2
Groundwater Gauging Data

Well No.	Top of Casing Elevation (feet above MSL)	Depth to Water (feet below top of casing)	Groundwater Elevation (feet above MSL)
TMW-3	51.36	65.28	-13.92
TMW-5	53.32	67.57	-14.25
TMW-12	51.67	66.40	-14.73
TMW-13	50.89	65.45	-14.56
WCC-11S	51.34	63.83	-12.49

After the water level was gauged, each well was purged using a submersible pump. Purged water was monitored in the field for electrical conductivity, temperature, and pH. Three borehole volumes of water were purged from each well and placed in a Department of Transportation approved 55-gallon drums.

Upon completion of well purging, a groundwater sample was collected from each well using a disposable bailer with a bottom-emptying device. Three 40-ml VOA vials were filled and placed in a cooler with ice and transported under standard chain-of-custody procedures to Severn Trent Laboratories in Santa Ana, California for analysis. The groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260B. The groundwater monitoring and sampling field data sheet for each well's sampling event is included as Appendix C. Groundwater analytical results are included in Appendix D.

Groundwater Analytical Test Results

The laboratory analytical results of groundwater samples collected in March 2002 (TMW-13 and WCC-11S), September 2002 (TMW-3 and TMW-12), and March 2003 (TMW-5), for the primary VOCs found at the Site are summarized in Table 3. Copies of the laboratory analytical reports are included as Appendix D.

Table 3
Groundwater Analytical Results

Analyte	TMW-3 (µg/l)	TMW-5 (µg/l)	TMW-12 (µg/l)	TMW-13 (µg/l)	WCC-11S (µg/l)
Cis-1,2-dichloroethene	30	41 J	<5	<1	14
1,1,1-trichloroethane	8.5	<100	<5	<1	<1
1,1-dichloroethene	160	610	17	0.31	16
Trichloroethene	4,500	4,300	120	74	72

µg/l = micrograms per liter
J = estimated result. Result is less than Reporting Limit.

Monitoring Well Closure

West Hazmat Drilling, Inc. was contracted by Haley & Aldrich, Inc. to close each of the five monitoring wells. The proposed well closure process consisted of first attempting to extract the PVC casing and screen by pulling with the drilling rig hoist. This process was unsuccessful since each of the monitoring wells had casing extensions added to accommodate the recent site redevelopment grading. The PVC casing, screen, grout and sand pack were then removed by overdrilling with an 10-inch outside diameter (OD) auger for the 2-inch wells (TMW-3, TMW-5, TMW-12, and TMW-13) and 12-inch OD auger for the 4-inch well (WCC-11S), to a total depth of approximately one foot below each well's respective total boring depth. TMW-13 was overdrilled with 17-inch auger from ground surface to 65 feet bgs in order to release a 10-inch auger that became stuck due to tight drilling conditions. The materials recovered during drilling were transferred into a roll-off bin for temporary onsite storage pending final disposition. Observations made during the respective well overdrilling are noted in the well closure logs included as Appendix E.

A photoionization detector (PID) was used during the fieldwork to monitor the relative concentration of VOCs present in soil cuttings and in the breathing zone. The PID used for this investigation was a RAE Systems MiniRAE Plus with a 10.6 eV lamp. PID readings did not exceed 0.3 parts per million.

Following the over-drilling, each borehole was grouted with a mixture of approximately four 94-pound bags of Portland cement and approximately 1/8 to 1/4 bags of Hydrogel per 40 gallons of water. During grout placement, a 1.5-inch diameter tremie pipe was placed at the bottom of the auger and grout was placed as the auger was extracted in 20-foot lifts from the final depth to approximately 10 to 12 feet bgs. Each borehole was then filled from approximately 10 to 12 feet bgs to the surface with concrete or one-sack slurry. The total grout volumes for each boring are noted in Table 4. Well closure logs are included as Appendix E.

Table 4
Well Closure Observations

Over-drilling Observations	**TMW-3**	**TMW-5**	**TMW-12**	**TMW-13**	**WCC-11S**
Original Depth of Well, feet	87	89	89	85	91
Depth of overdrilling (feet)	90	95	90	86	92
Blank casing removed by pulling (feet)	12	12	0	10	5
Blank casing removed by drilling (feet)	50.5	50.5	63	50	55
Screened casing removed (feet)	20	20	20	20	30
Auger depth before cuttings observed, feet bgs	0	0	0	0	0
Bentonite/grout/sand mix removed, (cubic feet)	47	47	40	114	72
Backfilling Observations					
Backfill mixture, Portland (bags) + Hydrogel (bags) + water (gallons)	4+1/8 +40	4+ ¼ +40	4+1/8 +40	4+1/8 +40	4+1/8 +40
Total quantity of Portland cement used (bags)	32	32	30	100	44
Total Quantity of Hydrogel used (bags)	1	1	1	4	1
Total Quantity grout backfilled into boring (gallons)	400	400	375	1250	550
Total Quantity grout backfilled into boring (cubic feet)	54	54	50	167	74

WASTE STORAGE, HAULING AND DISPOSAL

Purge and decontamination water from the groundwater sampling and well destruction activities was stored in five 55-gallon drums. Waste from the well destruction activities (sand pack and sealing materials) was contained in four roll-off bins. One soil sample was collected from each of the roll-off bins and analyzed for VOCs by EPA Method 8260B, toxicity characteristic leaching procedure for VOCs, and fish bioassay for hazardous waste. The analytical report for this sample is also included in Appendix D. The soil and wastewater are pending disposal by BRC.

Should you have any questions concerning the contents of this memorandum or require additional information, please contact either of the undersigned.

Sincerely yours,
Haley & Aldrich, Inc.

Scott P. Zachary
Project Manager

Robert L. Manriquez
R.G. No. 7407, R.E.A.
Senior Geologist

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STATE OF CALIFORNIA

Attachments:

Figure 1 – Site Location Map
Figure 2 – Site Plan

Appendix A – Boring and Well Construction Logs
Appendix B – County of Los Angeles Monitoring Well Destruction Service Request Application
Appendix C – Groundwater Sampling Field Data Sheet
Appendix D – Copy of Laboratory Reports & Chain of Custody
Appendix E – Well Closure Logs

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23 April 03
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

BOEING

Attention: John Geroch

Subject: **WELL CLOSURE REPORT GROUNDWATER MONITORING WELLS TMW-3, TMW-5, TMW-12, TMW –13 AND WCC-3S, BOEING REALTY CORPORATION, FORMER C-6 FACILITY, 19503 SOUTH NORMANDIE AVENUE, LOS ANGELES, CA**

Dear Mr. Geroch:

Please find enclosed for your review, a copy of the subject document prepared by Haley & Aldrich for Boeing Realty Corporation.

If you have any questions concerning this document, please contact the undersigned at 562-593-8623.

Sincerely,

Stephanie Sibbett
Boeing Realty Corporation

Cc: Mario Stavale, Boeing Realty Corporation
Dwight Merriman, RREEF

enclosure